

Testimony of

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Subcommittee on Aviation
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**NextGen: A Review of the RTCA Mid-Term
Implementation Task Force Report**



Introduction

The National Air Traffic Controllers Association (NATCA) is the exclusive representative of over 15,000 air traffic controllers serving the Federal Aviation Administration (FAA), the Department of Defense and the private sector. In addition, NATCA represents approximately 1,200 FAA engineers, 600 traffic management coordinators, 500 aircraft certification professionals, agency operational support staff, regional personnel from FAA's logistics, budget, finance and computer specialist divisions, and agency occupational health specialists, nurses and medical program specialists. NATCA's mission is to preserve, promote and improve the safety of air travel within the United States, and to serve as an advocate for air traffic controllers and other aviation safety professionals.

NATCA has a long history of supporting new aviation technology, modernizing and enhancing our nation's air traffic control system, and working to ensure that we are prepared to meet the growing demand for aviation services. So that everyone continues to have access to a safe and efficient National Airspace System (NAS), NATCA is an active member of the Radio Technical Commission for Aeronautics (RTCA) and a participant in the workgroup that made the recommendations that will be explored today. We fully support the RTCA's recommendations and applaud its policy of collaboration. We also recognize that the technological, procedural, and implementation details remain at the discretion of the FAA. We therefore offer the following recommendations:

NATCA's Recommendations

- 1. Collaboration** – RTCA recognizes the value of the subject matter expertise that NATCA provides, and its recommendations are stronger and more thorough because of the unique perspective NATCA offered. The FAA must heed this lesson and meaningfully include NATCA in all air traffic control modernization projects, from inception through implementation, in all regions and at all levels.
- 2. Work with NATCA to Develop and Implement Plans Based on RTCA Recommendations** – NATCA has confidence in the RTCA recommendations and we believe that many of the concepts laid out in the NextGen Mid-Term Implementation Task Force Report will, if properly executed, bring sufficient benefit to NAS users. However, the task force's recommendations are deliberately conceptual rather than tangible, and the details for implementation remain to be determined. The FAA must work closely with NATCA as they develop and implement these plans in order to ensure that the air traffic control system continues to work smoothly through the transition and beyond. NATCA's unique perspectives as air traffic control experts will give insight into the daily requirements of the new system and the adjustments that must be made for the changes to be most effective, most usable, and safest.
- 3. Workload Implications of Changes** – Many of the proposed changes, such as the best equipped, best served policy and the expansion of simultaneous approaches, will have profound implications on controller workload. It is imperative that these effects be acknowledged and that additional air traffic control positions and appropriate levels of air traffic controller staffing be established and maintained.
- 4. Training** – NextGen represents a significant shift in the technological backbone of the National Airspace System, as well as the procedures which govern its use. Thorough and

comprehensive air traffic controller and pilot training must be a key component of the transition in order to ensure safety and uninterrupted services. The high ratio of trainees in the air traffic controller workforce resulting from the 2006-2008 attrition wave will make this a particular challenge.

Collaboration

RTCA's NextGen Task Force is truly a collaborative environment. RTCA members from all aspects of the aviation community – from aircraft manufacturers to pilots, from airlines to air traffic controllers – are given an opportunity to meaningfully contribute and share their unique perspectives and expertise.

NATCA has been deeply involved in the RTCA NextGen Task Force. We participated on the Special Committee (SC)-214 for Air Traffic Operations, the SC-203 for unmanned aerial systems, SC-186 for ADSB, the Research and Planning (R&P) workgroup, ADSB workgroup, the RTCA leadership group, and the RTCA Task Force 5. NATCA representatives were also involved in 49 out of the 53 elements, more than any other RTCA member organization. In each of these settings, the RTCA recognized the value of NATCA's knowledge of day-to-day air traffic control operation, the needs of the system, and the real-world implications of the proposals being considered.

While NATCA is grateful for the opportunity to participate in the RTCA Task Force, it must be understood that RTCA participation is purchased and is not based on FAA invitation. The FAA has shut NATCA out of direct and meaningful collaboration in modernization projects, but we continue to believe that our input is vital to the safety of the NAS and the success of any FAA program. Therefore, NATCA purchased membership in RTCA in order to enable the Union to participate in forums such as this and have our input considered by the aviation industry if not by the FAA. RTCA membership is not a substitute for direct collaboration with the Agency, and it must not be regarded as such. It is NATCA's members who are responsible for the functionality of the air traffic control system and our subject matter experts have considerable insight into the technological and procedural improvements needed to deal with many and varied air traffic situations as well as the human interface needs of the system. The FAA must work meaningfully and directly with NATCA throughout the inception, development, and implementation of NextGen.

Formal collaboration with Union representatives has proven effective in successful modernization projects in years past. During the late 1990s and into the early part of this decade, NATCA had representatives on more than 70 modernization and procedure development teams¹ through the Controller Liaison Program. Together the FAA and NATCA completed more than 7,100 projects to install and integrate new facilities, systems and equipment into the NAS, as well as more than 10,000 hardware and software upgrades. The Controller Liaison Program allowed controllers to provide crucial insight and guidance for the development and implementation of some of the most effective technological and procedural advancements including: Advanced Technologies and Oceanic Procedures (ATOP), Display System Replacement (DSR), User Request Evaluation Tool (URET), Voice Switching Control System (VSCS), Domestic Reduced Vertical Separation Minimum (DRVSM), and Standard Terminal Automation Replacement System (STARS). Despite its success, the Liaison Program was

¹ National Air Traffic Controllers Association, *2002 Air Traffic Modernization Tools*.

terminated by the FAA Administrator in 2005. Since that time, the FAA has resisted any meaningful input from NATCA – to the detriment of the NAS.

Our new contract, which went into effect on October 1, 2009, states that within 120 days of the signing of the agreement, NATCA and the FAA shall meet to develop a program for full participation by the Union to further the development and implementation of NextGen.² To date, this meeting has not yet occurred. However, NATCA remains hopeful that this new contract language will eventually bring about the level of collaboration we have long sought.

Since the implementation of the 2009 contract, the FAA has been inconsistent in its willingness to reach out to or collaborate with NATCA. Last month, NATCA representative Eddie Kragh spoke before this Subcommittee about his participation in the NY VFR Airspace Task Force, which was formed after the tragic accident in the skies over the Hudson River. NATCA applauds the FAA for meaningfully including a NATCA subject matter expert in the response to that tragedy. Unfortunately, the FAA has not taken this approach on other projects equally critical to aviation safety. Even when it comes to other issues affecting the design of the New York area airspace, the FAA has been reticent to include NATCA; the Union has been rebuffed at our attempts to be meaningfully involved in the FAA's New York, New Jersey, Philadelphia airspace redesign efforts. Similarly, we have not had an opportunity to collaborate on En Route Automation Modernization (ERAM), despite its centrality to NextGen implementation in the en route environment, and we were refused even a formal briefing on Automatic Dependent Surveillance - Broadcast (ADS-B).

NATCA President Paul Rinaldi has met several times with Administrator Babbitt on the issue of collaboration. It seems as if the Administrator believes in the value of NATCA's participation and understands his contractual obligation to include the Union. This sentiment, however, has been slow to trickle down through the management ranks. Just days after Administrator Babbitt and Air Traffic Organization Chief Operating Officer Hank Krakowski referred to ADS-B as the backbone of NextGen and asked for NATCA's collaboration on its implementation, the FAA Human Resources Department refused to formally brief NATCA on ADS-B implementation at Louisville International Airport at Standiford Field, Bowman Field and the Gulf of Mexico. FAA Labor Relations referred to ADS-B as "*De Minimis*", or too trivial and insignificant to be the subject of a formal briefing and, if appropriate, bargaining as permitted by law or by our contract.

This type of inconsistency is unacceptable on such an important issue. NATCA is pleased that there has been a change in attitude at the highest levels of the FAA, but it is important that this new perspective be thoroughly and consistently translated into action. NATCA must be meaningfully included in all air traffic control modernization projects, from inception through implementation, in all regions and at all levels.

RTCA Task Force Recommendations

The collaborative nature of the RTCA Task Force allowed the RTCA to develop recommendations that were thorough and well considered. The depth and breadth of the expertise enabled the RTCA to create a product in which NATCA has a high level of confidence.

² Article 114 of the 2009 Contract Between the Federal Aviation Administration and the National Air Traffic Controllers Association, AFL-CIO, "NextGen Implementation."

This Subcommittee and the FAA must understand, however, that the recommendations are not intended as blueprints, but merely as guiding principals for the FAA. The technological and procedural details, as well as the precise implementation details, still remain to be determined by the Agency. What follows is an examination of some of the Task Force's recommendations and an identification of the operational and implementation challenges that must be addressed in order for each recommendation to be successful.

RTCA Recommendation: Best Equipped, Best Served

Threaded throughout the RTCA Task Force report is the concept of incentivizing equipage by offering preferential treatment in the operational environment as a reward – a best-equipped, best-served policy. The RTCA supports such an initiative as a relatively cost-neutral way of incentivizing equipage without imposing mandatory equipment standards on aircraft owners.

As with all of the RTCA's recommendations, the details for implementation were left to the discretion of the Agency. There are many ways of implementing such a policy, including dedicated runways for NextGen-equipped aircraft and time-of-day restrictions for under-equipped aircraft. It is important that the FAA collaborate with NATCA when developing the details of this program, as any plan for such a policy will significantly affect a controller's job duties.

First and foremost among the details that the FAA must consider is the way in which equipage information is provided to the controller. Currently, equipment suffixes appear at the end of the aircraft identifier on flight progress strips, but they do not appear on radar scope displays. Although en route controllers have access to flight progress strips or their electronic equivalents on URET displays, most terminal controllers do not. If policy dictates that operational decisions should be influenced by equipage, then that information must be visible to the controller on his scope in order to enable him to make these decisions quickly and safely.

Secondly, when determining the nature and extent of the best-equipped, best-served policy, the FAA must examine the effect the changes would have on controller workload. If, for example, a runway is reserved for NextGen-equipped aircraft, it may mean additional holding for unequipped aircraft or additional runway crossings, as unequipped aircraft will likely need to use runways that are farther from the gate. This may have a profound increase in controller workload, particularly at busy terminal facilities. The FAA must take these effects into consideration prior to making decisions about how to implement a best-equipped, best-served policy.

The FAA must also work closely with NATCA to determine how to deal with under-equipped aircraft. Particularly in areas in which heavy congestion makes holding impractical or impossible, this represents a significant challenge. John F. Kennedy International Airport (JFK), for example, handles air traffic for over sixty scheduled international passenger carriers from six continents, most of which are unlikely to be equipped with NextGen technology. New York airspace is highly congested and control of the surrounding airspace is divided among as many as five different air traffic control facilities. It would be problematic if these under-equipped European airliners were consistently forced into holding patterns due to limitations placed on them by the policy. At best, the best-equipped, best-served policy would exacerbate the already

severe delays in the New York area; at worst, it would create an untenable and therefore dangerous workload and coordination situation.

Lastly, it is important to realize that a best-equipped, best-served policy, at least in the short term, may have a negative impact on the overall efficiency of the air traffic control system. Currently, air traffic controllers are trained to provide service on a first-come, first-served basis, and utilize limited runways and airspace in the most expeditious manner. Best-equipped, best-served rules compel controllers to use factors other than efficiency (i.e. equipage) to make such decisions.

RTCA Recommendation: Surface

NATCA believes that both the safety and the efficiency of airport surface area usage could be significantly improved by broad utilization of Airport Surface Detection Equipment (ASDE-X). ASDE-X is designed to combat visibility limitations of tower controllers by providing radar-based visualizations of the position and movement of aircraft on the ground and in the air within five miles of the airport. This is particularly valuable at night and during inclement weather when visibility from the tower is limited. By taking input from radar sources in several different locations around the airport, ASDE-X has been able to reduce coverage gaps and false targets that plagued some of the predecessor technology. The RTCA believes and NATCA agrees that this technology could be further enhanced by adding ADSB coverage to ASDE-X.

The success of ASDE-X is attributable at least in part to the collaborative environment in which it was developed. ASDE-X was developed with the help of current air traffic controllers who acted as liaisons from NATCA. Together NATCA and the FAA worked to develop this technology which was able to effectively address deficiencies in the air traffic control system. Unfortunately, the Bush Administration terminated the liaison program before ASDE-X was installed at facilities and the program suffered glitches during implementation that may have been avoided or more quickly resolved with NATCA's involvement and support.

Recently, Administrator Babbitt announced that he would be expanding the ASDE-X program to additional airports outside the designated Operational Evolution Plan (OEP) 35. NATCA applauds this decision, as we believe that all airports would benefit from the enhanced surveillance. We hope to have the opportunity to work meaningfully with the FAA to facilitate a smooth and safe installation at these additional facilities.

RTCA Recommendation: Runways

The RTCA has suggested several ways of improving the efficient use of runways. Their recommendations included expanding the use of simultaneous approaches for closely spaced runways, precision runway monitoring, and expanded use of Converging Runway Display Aids (CRDA). NATCA supports each of these initiatives.

Expanding the use of closely spaced parallel runways would require a change in the separation standard for Instrument Landing System (ILS) approaches. Currently, controllers stagger approaches into closely spaced runways to minimize the risk of collision. If technology allowed more precise operations for both controllers and pilots, these standards could be reduced and the staggering could be unnecessary. It is important to ensure, however, that not only is the

technological infrastructure sufficient to support simultaneous approaches, but also that the human infrastructure is sufficient.

Simultaneous ILS approaches at JFK, for example, could be beneficial. However, the human infrastructure and equipment limitations are unable to support the safe and efficient use of this operation. There is currently only one air traffic control position responsible for simultaneous approaches into JFK. If such a procedure were to be implemented, the necessary increase in situational awareness, workload, and controller-pilot communication would make safe operation nearly impossible for one controller to manage. The position would need to be split into two final approach positions and both positions must be opened and staffed at any time when simultaneous ILS approaches would be conducted. It is also therefore of great importance that JFK Tower, New York TRACON and any other facility facing a similar situation be staffed with a sufficient number of fully certified controllers to ensure the safety of the system and the value of NextGen changes.

Expanded use of existing technology could also help improve both the safety and the efficiency of runway usage. Precision runway monitoring systems are highly sophisticated radar systems capable of refreshing data every second. Recent improvements allow this technology to utilize multilateral feeds, a method which is just as effective and less expensive. NATCA is in full agreement with the RTCA that this is very useful and we hope to have the opportunity to work meaningfully with the FAA to see this technology installed at more airports. Converging Runway Display Aids (CRDA) are also effective. A CRDA displays a ghost target on a controller's scope to simulate the location of an aircraft approaching on an intersecting runway, assisting a controller in ensuing safe spacing. Effective use of CRDA will not only improve the safety of intersecting runways, but also allow controllers to more efficiently utilize those runways.

As NATCA has previously testified, however, the most effective way to reduce delays is to build more runways³. Prior to the construction of the new runway, Atlanta Hartsfield-Jackson International Airport (ATL), for example, had a departure rate of 96 aircraft per hour under visual flight rules (VFR) conditions. Atlanta's fifth runway was opened on May 27, 2006. Since that time, the departure rate increased to 114 aircraft per hour VFR and 104-106 under instrument flight rules (IFR). A comparison of operations and delays was run from May 27 to September 30, 2006 against the same time period in 2005. ATL had an increase 3,097 total operations and had 13,927 fewer delays in 2006.

RTCA Recommendation: Digital Communications

A digital communication system that would enable a controller to issue routine clearances and other instructions to pilots via data transfer could be very effective in reducing frequency congestion and minimizing communication errors. Clear, unambiguous printouts or visual displays in the cockpit would reduce the problem of pilots misunderstanding controller instructions and controllers misunderstanding pilot read-backs. At busy facilities, frequencies are often congested with multiple aircraft operators attempting to communicate with a single

³ "Air Traffic Delays" John Carr before the Aviation Safety Subcommittee of the Senate Commerce, Science, and Transportation Committee. May 10, 2001; and "Airline Delays and Consumer Issues" Patrick Forrey before the Aviation Subcommittee of the House Transportation and infrastructure committee. September 26, 2007.

controller at one time, making it difficult for a controller to hear and understand each of them. If properly developed and implemented, digital communications would reduce this problem. There is even a possibility that it would enable controllers to safely handle a greater number of aircraft at one time.

However, any digital communication system would have a profound impact on a controller's job duties, how those duties are performed, and controller workload. Depending on the product that is developed and the procedures governing its use, digital communications has the potential to either increase or decrease a controller's workload. If a controller has to physically type out instructions and issue them verbally, his workload would increase significantly; if instead he had to press a single button on a keypad to issue routine instructions, his workload would be reduced. The usability of the controller interface is vital to the success of this program. It is therefore imperative that the FAA work meaningfully and directly with NATCA throughout the process of developing the digital communication system as well as during implementation.

RTCA Recommendation: Achieving Three and Five Miles of Separation

The RTCA cited the benefit of more closely achieving the current standards of separation, currently three or five miles depending on the operational environment. They went on to say that this can be achieved only if the FAA continues to take steps toward dismantling the punitive culture and continue moving towards a safety culture. NATCA agrees in the benefits of a safety culture and joins the RTCA in its support of the Air Traffic Safety Action Program (ATSAP) and the removal of punitive repercussions of minor losses in separation.

NATCA is concerned, however, about the implication that controllers are currently employing excessive separation. This is a myth which must be dispelled. There is no chronic problem of excessive spacing. Rather, controllers provide the spacing necessary to maintain the margin of safety in a complex environment that is influenced by a wide variety of factors. Among these factors are weather conditions, compression effects, complex runway configurations, pilot technique, controller fatigue, flight scheduling, complex and limited airspace, and the delivery rate of aircraft over arrival fixes.

Spacing Over and Above Required (SOAR) is a software program designed to demonstrate the fabricated problem of excessive spacing. SOAR is a simple program which measures the rate at which aircraft pass over a particular point in space. While it can accurately measure distance between aircraft passing over that point, it cannot capture the dynamic nature of compression upon arrival, nor does it take into account mitigating factors that might render increased spacing unavoidable, beneficial, or necessary to maintain safety.

For example, on March 31, 2008 the Systems Operations Traffic Management Officer for New York TRACON wrote an email to the management team that read, "SOAR values very high. GDP [ground delay program] is a result. This is an ongoing problem." While SOAR values were indeed high on the date in question, traffic management logs clearly state that the arrival rate had to be lowered due to low ceilings and weather moving in faster than expected. The log summary from the FAA Command Center had the following entry at 0405z: "low cigs at LGA resulted in holding and lengthy ESP delays from ZDC Around 1250z we decided it was time to implement ad GDP at ARR 35." By relying solely on SOAR values, the FAA painted a false picture of inefficient air traffic controllers and excessive spacing. In reality, controllers and

traffic managers were making spacing decisions based on situational need and maintaining safety.

NATCA agrees with the RTCA that the FAA should take measures which give controllers the flexibility to run aircraft as closely as possible without sacrificing safety. ATSAP and the removal of the punitive repercussions of minor losses of separation help in this regard, but controllers are already working hard to ensure aircraft are efficiently and safely separated.

Staffing and Experience at Air Traffic Control Facilities

NATCA has previously testified to the wave of attrition in the air traffic controller workforce that resulted from the FAA's imposed work rules⁴. We are pleased to report that, due large part to the work of this Subcommittee and the Obama Administration, we have recently entered into a new collective bargaining agreement with the FAA. Attrition seems to have begun to return to normal levels in anticipation of this change, but the effects of high attrition rates from 2006-2008 continue to be felt throughout the system.

As of the end of Fiscal Year 2009, there were 11,728 fully certified controllers, 25-percent below the number of controllers standard jointly authorized by the FAA and NATCA in 1998 based on scientific studies⁵. As a result, shifts often operated with less than the optimal number of controllers, necessitating the combining of positions. According to an April 2009 report by the DOT Inspector General, the "FAA faces an increasing risk of not having enough fully certified controllers in its workforce."

In 2000, NATCA and the FAA worked on a project designed to improve the efficiency of the NAS. A key element in this project was the alleviation of choke points by breaking congested air traffic control positions into multiple positions in order to enable more efficient handling of traffic. Understaffing effectively reverses this process, creating choke points by combining positions. It places one controller responsible for vectoring a larger volume of aircraft, monitoring a larger number of conflict points, and communicating with a greater number of pilots.

Additionally, the attrition wave caused the FAA to lose more than 50,000 years of air traffic control experience. The trainees that were hired to fill the vacancies left by the attrition wave have potential to develop into excellent controllers, but they are still new and inexperienced. Unlike those who came before them, they have less opportunity to learn from or work with experienced coworkers, as many of these experienced controllers have chosen to leave the FAA.

For air traffic controllers, experience means that everyday operations can easily be conducted safely, and efficiency can become a priority. It means having seen and worked through a wide variety of unusual circumstances and having developed enhanced quick thinking and problem solving skills. Quick thinking and problem-solving skills are particularly important when attempting to integrate new technology and procedures. Glitches in implementation are

⁴ "Air Traffic Control Facility Staffing," Patrick Forrey before the House Transportation and Infrastructure Committee Subcommittee on Aviation, June 11, 2008.

⁵ Although the staffing levels authorized in 1998 do not exclude developmentals, at the time the contract was signed, developmentals in the system accounted for less than 10 percent of the authorized levels.⁵ No one at that time predicted that the number of trainees in the system would come to make up a significant portion of the workforce or that uncertified controllers would be relied upon to work large amounts of air traffic.

unavoidable and it is critical to have controllers who are easily able to adapt and maintain safety during testing and early implementation.

Recently, the FAA conducted tests on En Route Automation Modernization (ERAM), the NextGen project to replace the aging HOST system, which has served as the technological backbone of en route air traffic control. During testing, the technology encountered a critical glitch and the test had to be terminated. In order to transition back to the current system, the facility needed to shut down ERAM and operate temporarily on the HOST backup system. However, only those experienced controllers who had worked midnight shifts were familiar and comfortable with additional procedures necessary to operate safely using the backup system, which lacks some automation capabilities. The confusion level was high and a significant amount of data was lost over the course of the transition.

Because of the inexperience level in the workforce at large, we can expect this situation to repeat itself as other technologies and procedures are tested. The FAA must prepare for this by improving training procedures and by ensuring proper staffing levels. The FAA must also remain transparent in disclosing the number of trainees in the system to stakeholders and work with NATCA and an independent third party in developing those standards. We applaud this Subcommittee and Chairman Costello for including language in H.R. 915 to include a study to be conducted by the National Academy of Sciences to establish a facility-based ratio of trainees that the system can safely and efficiently handle.

Training

Training must also be a prominent component of the FAA's NextGen plans. Any significant changes to technology or procedures must be accompanied by comprehensive training for both air traffic controllers and pilots.

NATCA is concerned by recent precedent set by the FAA with regard to training in recent years. Over the last several years, recurrent training for certified controllers has dwindled into near non-existence. Often, changes in operational procedures are implemented without any kind of meaningful training. Instead, a binder is placed in the operational areas containing memos announcing the change. Controllers are instructed to read and initial these announcements, and by so doing, the controller assumes responsibility for having learned the new rules. This is unacceptable.

Controllers must be fully briefed on all changes in technology and procedure and must have the opportunity to ask questions. If changes are significant, as in the case of many NextGen initiatives, controller must have the opportunity to participate in simulator training. Allowing controllers to conduct simulated operations will enable controllers to achieve some level of comfort with the new technology or procedure before using it on live traffic. Similarly, pilots must also be fully briefed, trained and provided with published documentation on changes in procedure.

The FAA has not done this in early NextGen initiatives thus far. In December 2007, for example, the FAA implemented the first phase of its airspace redesign of the NY/NJ/PHL area. The key component of this phase was the use of dispersal headings for aircraft departing from Philadelphia and Newark Airports. By fanning departures out over multiple vectors, the FAA hoped to increase the departure rate for these airports. Controllers never received meaningful

training on this change in procedure, but were instead instructed to read and initial a memo stating the rules. Similarly pilots were not informed of the changes and were not prepared to be issued these headings. This lack of training for both pilots and controllers created an environment conducive to confusion and miscommunication.

The issue of training is complicated by the air traffic controller staffing situation described earlier. The FAA hired large numbers of trainees to make up for the controllers lost during the attrition wave, most of which have not yet been certified. Nearly one-quarter of the workforce has not yet achieved certification at any facility and an additional estimated five-percent are in training following a transfer. The current burden of training and shortage of certified controllers makes supplementary training difficult. Some facilities may simply not have enough certified controllers to ensure uninterrupted safe operations during the necessary training exercises. The FAA must take this into account when planning when and where to deploy NextGen systems. Bypassing or reducing training is not an acceptable option.

Conclusion

NATCA supports the RTCA's recommendations and applaud their policy of collaboration. We also recognize that the technological, procedural, and implementation details remain at the discretion of the FAA. In order for the transition to NextGen to be smooth, safe and effective, the FAA must work closely with NATCA as they develop and implement these. The FAA must meaningfully include NATCA in all air traffic control modernization projects, from inception through implementation, in all regions and at all levels. Together NATCA and the FAA cannot only develop the most effective changes to technology and procedures, but we can also work to mitigate the workload implications, determine proper staffing levels, and develop effective training programs.